

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

<i>In the Matter of:</i>)	
)	
Connect America Fund)	WC Docket No. 10-90
)	
Developing a Unified Intercarrier Compensation Regime)	CC Docket No. 01-92
)	

**REPLY OF CENTURYLINK IN SUPPORT OF ITS PETITION FOR A
DECLARATORY RULING**

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INTRODUCTION AND SUMMARY

The core question presented by CenturyLink’s petition¹ is what are the core functions of the end office switch, for which access charges are assessed pursuant to 47 C.F.R. § 69.106. CenturyLink agrees with AT&T that “[t]he issue on remand...is whether over-the-top VoIP providers and their LEC partners provide the ‘functional equivalent’ of *end* office switching or *tandem* switching.”² This question has arisen because, with IP technology, carriers’ networks—and the way they carry and deliver telephone calls—have changed dramatically. Among other things, it has become possible to separate the functions traditionally performed by the end office switch in an old-fashioned circuit-switched network in creating and maintaining a call path between the calling and called party, from the physical connection required in a traditional circuit-switched network between the end office switch and the local loop. AT&T and Verizon argue that when the Commission adopted the VoIP Symmetry Rule in 47 C.F.R. § 51.913, and stated, “we adopt rules that permit a LEC to charge the relevant intercarrier compensation for functions performed by it and/or by its retail VoIP partner, regardless of whether the functions performed or the technology used correspond precisely to those used under a traditional TDM

¹ Petition of CenturyLink for a Declaratory Ruling, WC Docket No. 10-90 and CC Docket No. 01-92 (filed May 11, 2018).

² Comments of AT&T on CenturyLink Petition for Declaratory Ruling, WC Docket No. 10-90 and CC Docket No. 01-92, at 5 (filed June 18, 2018) (“AT&T Opposition”). AT&T’s suggestion, *see id.* at 3 n.4, that the D.C. Circuit’s decision could be construed to be a substantive unreasonableness decision is simply wrong. The Court made clear that it was remanding for a lack of sufficient explanation, not because the Commission could not reasonably have reached the result that it did. *See AT&T v. FCC*, 941 F.3d 1047, 1049 (D.C. Cir. 2016). But the Court never said that the Commission could not provide a more expansive explanation; indeed, it acknowledged that the Commission could provide additional explanations addressing various AT&T arguments. *See id.* at 1055-1056.

architecture,”³ the Commission nonetheless tied a portion of that intercarrier compensation, end office local switching charges, to a function that was not necessary in IP architecture—that is, the function of creating a circuit with the local loop—rather than on the functions of the local switch in a TDM network that uniquely, and distinct from both the tandem and any remote concentrator, created and maintained a switched voice call path.

AT&T and Verizon’s interpretation of local switching as requiring a *physical* connection to the end user’s loop contradicts the plain meaning of not tying intercarrier compensation to “whether the functions performed or the technology used corresponds precisely to those used in a traditional TDM architecture.”⁴ It is only in the TDM architecture that the direct connection from switch to loop is necessary; VoIP can be provisioned with or without that direct connection. Put differently, AT&T and Verizon’s interpretation is a technologically-dependent interpretation.

Furthermore, AT&T and Verizon contend that the core function of end office switching is to provide a physical connection to the subscriber line to the end user’s premises. But this test in and of itself cannot be right: it fails even to distinguish between switched access and special access, or a switch from a remote concentrator. A multiplexer can connect multiple special access subscriber lines to a trunk, aggregating traffic—as can a remote concentrator in a switched network. Yet neither are switches—and end office switching charges apply to neither. The core distinguishing feature of an end office switch must be something other than connecting lines to trunks.

The one thing that cannot happen without an end office switch in a traditional circuit-switched network is that a call cannot begin. In a traditional circuit-switched network, it is the

³ *Connect America Fund et al.*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd. 17,663 ¶ 970 (2011) (“*Transformation Order*”).

⁴ *Id.*

end office switch that uniquely creates the voice call path—not the remote concentrator and not the tandem. AT&T does not dispute this point, even as it attempts to obfuscate it. To be sure, a tandem generates signals that *continue* a call set up process that was initiated by the end office switch, but the tandem does not *start* that call set-up process on its own. In a VoIP network—whether “facilities-based” or “over-the-top”—this function of creating the voice path is performed by the voice application server. It is this function—the creation of the voice call path—that is the core of the functional equivalence test that CenturyLink has proposed for end office switching, and it is the function that best distinguishes a tandem from an end office switch.

None of *Revised RAO Letter 21*,⁵ the *RAO 21 Reconsideration Order*,⁶ or *YMax I*⁷ dictate a different conclusion. *Revised RAO Letter 21*, in distinguishing between a remote switch and a concentrator, supports the conclusion that the creation of the voice path is a function of the end office switch; that order concluded that the feature that differentiated a remote switch from a concentrator was that the remote switch can switch calls—that is, create the voice path—between users served by that same remote unit.⁸ The *RAO 21 Reconsideration Order* focused on the presence of a “switching matrix”—which, again, is the capability to create a voice path. Although it articulated that the function of the switching matrix was to “interconnect[] lines and trunks,” that did not simply mean connecting those facilities (which is a function performed by remote concentrators), but rather it meant interconnecting the appropriate facilities to create the

⁵ *Responsible Accounting Officer Re: Classification of Remote Central Office Equipment for Accounting Purposes*, Letter, 7 FCC Rcd. 6075 (1992) (“*Revised RAO Letter 21*”).

⁶ *Petitions for Reconsideration and Applications for Review of RAO 21*, Order on Reconsideration, 12 FCC Rcd. 10,061 (1997) (“*RAO 21 Reconsideration Order*”).

⁷ *AT&T Corp. v. YMax Communications Corp.*, Memorandum Opinion and Order, 26 FCC Rcd. 5742 (2011) (“*YMax I*”).

⁸ *Revised RAO Letter 21* at *1.

desired voice path—*i.e.*, the path to the called party.⁹ In any event, neither *Revised RAO Letter 21* nor the *RAO 21 Reconsideration Order* spoke to the issue facing the Commission here of how to distinguish between two types of switches—a tandem and an end office switch.

Finally, no amount of contortion can transform the holding of *YMax I* into a decision addressing whether an over-the-top VoIP provider can assess end office access reciprocal compensation charges. The Commission limited its *YMax I* ruling to the question whether YMax had properly described its service in its tariff, and expressly reserved the question whether end office switching access charges could be collected if properly described in the tariff.¹⁰ The Commission nowhere ruled that tariffs that accurately described the functions provided would also be unlawful. For this reason, the Commission did not need to overrule *YMax I* when it issued the *Transformation Order*; and it expressly noted in the *Transformation Order* that YMax’s holding—that a carrier must accurately describe the services it was tariffing—remained good law.¹¹ AT&T and Verizon ignore the fact that YMax’s core problem was that YMax, unlike other carriers, failed to accurately describe the functions it provided.¹²

AT&T and Verizon conveniently ignore the disruptive consequences that a “physical connection” requirement would have on today’s commercial reality—consequences that would be in direct contravention of the stated goals of the *Transformation Order*. Over-the top VoIP pervades enterprise communications solutions today, and is commingled with traffic delivered to and from enterprise users over dedicated wireline connections purchased by the end user. Unified communications and collaborations services—which, among other things, provide the

⁹ *RAO 21 Reconsideration Order* ¶ 11.

¹⁰ *YMax I* ¶ 14 n.55.

¹¹ *Transformation Order* ¶ 970 n.2026.

¹² *YMax I* ¶ 43 n.123.

ability to place and receive calls from anywhere, whether at your office at work, at home telecommuting, on call at a client’s office, in an airport, or while sitting in the coffee shop down the street—are common enterprise communications solutions. Indeed, both AT&T and Verizon market these solutions on their websites.¹³ In these solutions, over-the-top VoIP calls and VoIP calls delivered over dedicated facilities cannot be readily distinguished. This technology is so commonplace that AT&T does not even attempt to measure it, instead billing end office switching charges on all such calls. The reason: it is impossible to determine whether a VoIP call is over-the-top or facilities-based.

Nor does AT&T’s and Verizon’s interpretation of the VoIP Symmetry Rule as applying only to “facilities-based” VoIP in which the VoIP provider also provides the “subscriber line” lead to coherent results. What does it mean to connect to the “subscriber line”? For example, under AT&T’s and Verizon’s definition of functional equivalence, CenturyLink could charge end office switching for a call from a Skype for Business user that was carried over a managed private network, regardless of the provider, but could only charge end office switching for the same call carried over an Internet connection if CenturyLink rather than, for instance, Comcast

¹³ See AT&T, Voice and Collaboration Tools, <https://www.business.att.com/content/infographic/vc-att-collaborate-what-is-collaborate-infographic.pdf> (last visited July 2, 2018) (attached as Exhibit A); AT&T, Enable Collaboration across businesses, locations and devices, <https://www.business.att.com/content/productbrochures/conferencing-mslync-product-brief.pdf> (last visited July 2, 2018) (attached as Exhibit B); AT&T, SIP Trunking, <https://www.business.att.com/solutions/service/collaboration/voip/sip-trunking/> (last visited July 2, 2018) (attached as Exhibit C); AT&T, Get talking with VoIP business solutions, <https://www.business.att.com/content/infographic/voip-infographic.pdf> (last visited July 2, 2018) (attached as Exhibit D); AT&T, A converged network solution, <https://www.business.att.com/solutions/service/collaboration/voip/sip-trunking/#Howitworks> (last visited July 2, 2018) (attached as Exhibit E); Verizon; Business VoIP for Enterprise & Medium Companies, <https://go.verizon.com/business/medium/voip> (last visited July 2, 2018) (attached as Exhibit F); Verizon; Work happens everywhere. Make it easier with Microsoft Office 365, http://www.verizonenterprise.com/resources/office-365-solutionsbrief_en_xg.pdf (last visited July 2, 2018) (attached as Exhibit G).

was the Internet service provider. AT&T and Verizon’s interpretation of the VoIP Symmetry rule—which was meant to reduce litigation and provide a coherent set of “go forward” rules to govern PSTN-VoIP intercarrier compensation during the transition to “bill-and-keep”— will lead to hopeless complexity and litigation, as providers dispute how many minutes of calls to the same numbers are “over-the-top” or “facilities-based.”

Accordingly, the only sustainable and technologically neutral line to draw to distinguish a tandem from an end office switch is which device actually initiates a call from a caller to which it is connected. In a VoIP network, that function is performed by the voice application server, and not by the ISP. Thus, the voice application server performs the functional equivalent of end office switching, and when the LEC or its VoIP partner provide that function, the LEC is entitled to bill access charges.

Finally, with respect to Verizon’s argument that a clarified VoIP Symmetry Rule should only apply to terminating traffic, that position is not reasonable or justifiable. To the extent there are problems with arbitrage on 8YY traffic, that is an issue that cuts across access technologies and networks—whether over-the-top VoIP, facilities-based VoIP, wireline TDM, or mobile wireless. That can and should be addressed in the Commission’s open proceeding on that very issue, not by contorting the VoIP Symmetry Rule.

I. THE TECHNOLOGY-NEUTRAL DISTINGUISHING FUNCTION OF THE END OFFICE SWITCH, AS COMPARED WITH A TANDEM, IS CALL INITIATION.

A. Defining End Office Switching by Physical Connections to Loops Imposes a Technology-Specific Definition in Violation of the *Transformation Order*.

When it adopted the VoIP Symmetry Rule, the Commission made clear that it was “adopt[ing] rules that permit a LEC to charge the relevant intercarrier compensation for functions performed by it and/or by its retail VoIP partner, regardless of whether the functions performed or the technology used correspond precisely to those used under a traditional TDM

architecture.”¹⁴ Yet by arguing that end office local switching must include a physical connection to the subscriber’s loops, AT&T and Verizon would tie access reciprocal compensation charges precisely to a traditional TDM architecture.

As discussed above, a traditional circuit-switched architecture requires a physical circuit to be created. A loop must connect to a switch, either directly or through a concentrator, in order to create a circuit, because there is no other way for traffic to reach the switch. In a VoIP architecture, however, the voice application server—the device that carries out the same functions as the TDM end office switch in terms of, on the originating end of the call, receiving the dialed digits, determining where the call is to be routed, and initiating the process of creating the call path—does not need to have a dedicated physical connection to the end user. As examples, the voice application server can sit behind a telephone company’s or cable operator’s network, and deliver packets to and receive packets from, for instance, a dedicated voice channel over that telephone company’s or cable operator’s network; it can also receive and deliver packets from a dedicated VPN purchased by an end user from the voice provider or from a different carrier; or it may reach the end user over non-dedicated Internet access services. It is important to note—contrary to AT&T’s claim¹⁵—that in all of these cases, the end user customer is paying the VoIP service provider for the use of the VoIP application server; it does not pay the ISP that provides broadband service but that is not the end user’s VoIP provider for these VoIP application server functions—or indeed for any VoIP functions.¹⁶

¹⁴ *Transformation Order* ¶ 970.

¹⁵ *See* AT&T Opposition at 14.

¹⁶ The ISP is being paid by the consumer only for providing Internet access, not VoIP capabilities.

There is no reason inherent in the architecture of VoIP service to tie any switching functions performed by a VoIP provider to physical transmission over a loop to the end user. Indeed, “over-the-top” VoIP exists because transmission and switching in an IP network can be divorced.¹⁷ AT&T’s and Verizon’s insistence on tying compensation for end office switching to transmission over a physical loop limits access reciprocal compensation to only the situation in which the functions performed “correspond precisely to those used under a traditional TDM architecture”—which is exactly what the Commission said it was *not* doing. Accordingly, it would be contrary to the express language and plain meaning of the *Transformation Order* to require a VoIP provider to supply a physical transmission line to the end user in order to provide the functional equivalent of ILEC end office local switching as compensated pursuant to 47 C.F.R. § 69.106.

AT&T’s attempt to discount the fact that the local switching rate element in 47 C.F.R. § 69.106 does not include line ports¹⁸ simply highlights that fact, as well as the technology-specific nature of AT&T’s crabbed view of functional equivalence. Of course in a traditional circuit-switched network the local switch will be connected to the separately-charged line ports. That is inherent in the circuit-switched architecture. But what is critical for the analysis of functional equivalency is whether line ports are a part of the function for which end office local

¹⁷ Indeed, this is a true statement even for some modern TDM networks, as noted by Teliax in its comments. *See* Comments of Teliax, Inc., WC Docket No. 10-90 and CC Docket No. 01-92 at 10 (filed June 18, 2018) (“infrastructure supporting the existing TDM transmission aspects of the PSTN that remain in place today are often interconnected with a packetized or IP enabled backbone network.... This is important to understand because disparate TDM site interconnections are often transported via an IP path. This IP path is the same type path that established from the end user to the VoIP provider.”).

¹⁸ *See* AT&T Opposition at 26-27.

switching is assessed. AT&T acknowledges—as it must—that line ports are not part of the § 69.106 charges.

B. Physical Interconnection of Lines and Trunks Cannot Be the *Sine Qua Non* of End Office Switching as Compared to Tandems.

AT&T and Verizon’s argument that the core function that defines an end office switch is the physical connection of subscriber lines to trunks¹⁹ is too broad and, by its terms, would encompass special access arrangements, tandems, and remote concentrators that are clearly not end office switches. Simply connecting a number of smaller circuits to a larger one—which is what happens when interconnecting lines to trunks—is not by itself end office switching and does not capture what uniquely distinguishes an end office switch.

AT&T relies on the *RAO 21 Reconsideration Order* to establish the proposition that the actual connection of lines and trunks is the key function that distinguishes an end office switch from a tandem.²⁰ But, of course, the *RAO 21 Reconsideration Order* did not say that. It was not distinguishing end offices from tandems; it was distinguishing central office switches from remote concentrators. In that context, the Commission stated, “interconnection, *i.e.*, the actual connection of lines and trunks, is the characteristic that distinguishes switches from other central office equipment.” The Commission then continued, “If, therefore, a piece of remote equipment is capable of interconnecting lines or trunks, *i.e.*, if it has the switching matrix required for call interconnection,” the costs should be classified as central office switching equipment.²¹ But that

¹⁹ See, e.g., *id.* at 6; Comments of Verizon on Petition of CenturyLink for a Declaratory Ruling, WC Docket No. 10-90 and CC Docket No. 01-92, at 2 (filed June 18, 2018) (“Verizon Opposition”).

²⁰ See AT&T Opposition at 6.

²¹ *RAO 21 Reconsideration Order* ¶ 11 (specifically referencing Accounts 2210 through 2212, 47 C.F.R. §§ 32.3110 – 32.3112).

language does not distinguish end office switches from tandems, as both end office switches and tandems contain a “switching matrix” and thus pass the test for central office switching equipment. As further confirmation that the *RAO 21 Reconsideration Order* is not determinative, both tandem and end office switches are included in the specific Part 32 accounts referenced in the *RAO 21 Reconsideration Order*.

Moreover, lines can be directly connected to trunks without switches at all in a special access arrangement in which multiple lines from an end user are terminated in a multiplexer at a central office, which then connects to a trunk. Such a configuration might be seen where several PBXs simply bypass the end office switch and connect directly to an IXC. In that case, no one would contend that the multiplexer was an end office switch, even though it connects lines and trunks. And in these situations, because no end office switching occurs, no access reciprocal compensation is assessed.

Similarly, a remote concentrator—the actual subject of both the *Revised RAO 21 Letter*, and the *RAO 21 Reconsideration Order*—connects lines and trunks. In the case of a remote concentrator, individual subscriber lines reach the concentrator and then are consolidated onto high capacity feeder trunks to be transported, for switched traffic in a TDM network, to the end office. AT&T’s and Verizon’s proposed test for an end office switch—connecting subscriber lines to trunks—would encompass the remote concentrator. Thus it cannot be correct.

If further evidence is needed that the test of “interconnection of lines and trunks” does not yield a definitive delineation between an end office switch and a tandem, one need only look at the Commission’s own use of this phrase. The 1991 order requesting ARMIS information submission defines “central office switches” as “assemblies of equipment designed to establish connections between lines and trunks, including *access tandems, local, class 5 switching*

*machines, and any associated remotes.”*²² This same definition was published in the Commission’s Statistics of Common Carrier Reports for many years.²³

C. Creating the Call Path Is the Appropriate Test for End Office Switching Functionality.

As CenturyLink explained in its petition, none of tandems, remote concentrators, or multiplexers connecting special access lines *initiate a telephone call*—or, that is, in a circuit-switched world, give the initial instruction to the network to establish the circuit that will carry the voice call. This is the key step performed by the “switching matrix” in an end office switch as compared with a tandem.

AT&T does not refute CenturyLink’s technical analysis but tries to argue—without any technical declarations—that because all switches have some call control functions, the end office switch is not unique in *initiating* call set-up.²⁴ But of course it is. And that is the case not just because it is the first piece of electronics in the call path, as AT&T would suggest.²⁵ After all, a remote concentrator can be the first piece of electronics in the call path, and it will route the call

²² *Revision of ARMIS USOA Report (FCC Report 43-02) for Tier 1 Telephone Companies and Annual Report Form M*, Order Inviting Comments, 6 FCC Rcd. 5434 at tbl. X (Common Carrier Bur. 1991) (emphasis added); *see also Policy and Rules Concerning Rates for Dominant Carriers*, Memorandum Opinion and Order, 6 FCC Rcd. 2974, Row Instructions Table I (Common Carrier Bur. 1991) (first set of instructions which defined “switching entities” as “assemblies of equipment designed to establish connections between lines and trunks. Switching entities include access tandems, local, class 5 switching machines and any associated remotes.”).

²³ *See e.g.*, Federal Communications Commission, *Statistics of Communications Common Carriers, 2004/2005 Edition* at 22 (2005), <https://docs.fcc.gov/public/attachments/DOC-262086A1.pdf> (“Central office switches are assemblies of equipment and software designed to establish connections among lines and between lines and trunks, including access tandems, local, class 5 switching machines and associated remote switching machines.”).

²⁴ *See* AT&T Opposition at 21.

²⁵ *See id.* at 22.

on to the central office, but it does not send out the first IAM signaling message to signal the rest of the network to establish a circuit path to the terminating end office. For a VoIP call—whether facilities-based or over-the-top—there can be any number of intermediate routers that relay packets containing information to direct the VoIP provider to set up a VoIP call, but those packets are not read and acted upon until they reach the voice application server, which then starts the process of establishing the VoIP session.

Similarly, the tandem also does not send out that first IAM signaling message. As the Commission outlined in *Ameritech Operating Companies*²⁶—and as AT&T conveniently ignores—the tandem first *receives* an IAM message from the initiating end office, before generating its own IAM message to establish the next link in the call. But without a signal from the end office, the tandem would have no instruction against which to react. This is distinctly different from the end office switch in a TDM network and from the voice application server in a VoIP network, both of which react to messages transmitted from the end user, and not from an intermediate switch. Thus when AT&T says that the end user’s broadband provider is the only entity that directs the packets that constitute a VoIP call on or off of the individual loop facility—and therefore initiates a call—it is wrong. The broadband provider, in fact, *cannot* direct those packets—only the voice application server can collect those packets and, in turn, generate the signals throughout the network that initiate a new call.²⁷ In this respect, all of the

²⁶ *Ameritech Operating Companies*, Order, 11 FCC Rcd. 3839 ¶ 5 (Common Carrier Bur. 1996).

²⁷ On the terminating end, the voice application server is the only device that can collect packets from the recipient indicating the call has ended and generate signals through the network terminating the call.

intermediate servers between the end user and the voice application server function like remote concentrators—that is, devices that “depend[] on the host switch to switch all calls.”²⁸

AT&T reiterates arguments that the SIP messages processed by the voice application server have no role in call initiation because “the exchange of SIP messages is independent of any underlying ‘telecommunications,’” as the Commission held in the *Pulver Order*.²⁹ But this argument ignores the critical context of the communication—Pulver.com provided peer-to-peer communications; as such, Pulver.com could never have been performing local switching for the purposes of access reciprocal compensation charges because Pulver.com was not interconnected with the PSTN and neither end of that communication was entitled to receive those charges.³⁰ In contrast, interconnected VoIP providers and their LEC partners do provide the call set-up, supervision, and management required for assessing end office local switching charges.

Although *Revised RAO Letter 21* and the *RAO 21 Consideration Order* were focused on distinguishing a remote concentrator from a switch, and not an end office switch from a tandem, insofar as they are relevant here, they support a focus on the creation of the call path as a critical function of an end office switch. In *Revised RAO Letter 21*, the key distinction between a remote concentrator and a remote switch was that the remote concentrator never actually selected the routing to the call destination. For a concentrator, “all calls are switched by the central office switch to which the concentrator is connected,” meaning that “the voice path will always extend

²⁸ *Revised RAO Letter 21* at *1.

²⁹ AT&T Opposition at 23.

³⁰ See *Petition for Declaratory Ruling that Pulver.com’s Free World Dialup is Neither Telecommunications Nor a Telecommunications Service*, Memorandum Opinion and Order, 19 FCC Rcd. 3307 ¶ 9 (2004); see also Letter from John T. Nakahata to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 10-90 & 05-3337, GN Docket No. 09-51, and CC Docket Nos. 01-92 & 96-45, at 4 (filed Apr. 15, 2013) (“Apr. 15, 2013 Level 3 Ex Parte”).

to the host switch even for calls between subscribers served by the same remote terminal of a concentrator.”³¹ This meant that, if the connection between the remote concentrator and its switch failed, calls could not be created because there was no way for the call to reach the point at which it was created. By contrast, a remote switch was one capable of creating a voice path for at least some calls—at a minimum those served from the same remote switch.³² In that case, if the link between the remote switch and its host switch was severed, the remote switch could still create a voice call path to some other parties.³³

Like the remote switch in *Revised RAO Letter 21*, the voice application server is the minimum point that must be reached in order to create a voice call path. As such, no voice call path can be created without reaching the voice application server. This is different from a tandem, which in a TDM network cannot be reached on a switched call if the link to the end office is severed.

All of this illustrates that the answer to the DC Circuit’s question on remand—*what are the core functions of the end office switch as compared to the tandem?*—is that the end office switch initiates a call and, on the other end, monitors whether it is answered and, if so, when it is terminated. It also illustrates that the Commission’s conclusion in the *2015 Declaratory Ruling*³⁴ was correct and is the most logical and reasonable application of the functional equivalent test.

³¹ *Revised RAO Letter 21* at *1.

³² *Id.*

³³ *Id.*

³⁴ *Connect America Fund, et al.*, Declaratory Ruling, 30 FCC Rcd. 1587 (2015) (“*2015 Declaratory Ruling*”).

D. *YMax I* Does not Establish a Test for the Functional Equivalent of an End Office Switch.

The conclusion set forth above does not run afoul of the Commission’s decision in *YMax I*. AT&T and Verizon assert that *YMax I* establishes that an end office switch must connect trunks to subscriber loops.³⁵ But this assertion ignores the post-*YMax I Transformation Order*, which expressly stated that it would analyze functions “regardless of whether the functions performed or the technology used correspond precisely to those used under a traditional TDM architecture.”³⁶

As the Commission correctly recognized in the *2015 Declaratory Ruling*, the means of transporting the voice media stream to the end user need not be tied to the device that performs switching in an IP network.³⁷ The Commission observed that the connection between lines and trunks was required in a traditional circuit-switched network because of the need to create a continuous physical circuit.³⁸ But there is no similar technological imperative to create a circuit to deliver traffic in a VoIP network. Thus tying end office switching functionality to the physical reality necessitated only in networks in which a continuous circuit is required to create a call path is a technology-dependent, not technology-neutral, application.

Nor, as AT&T and Verizon argue, does *YMax I* articulate the Commission’s contemporaneous understanding of functional equivalence as used in the *Transformation Order*.³⁹ At the time *YMax I* was decided, the Commission was still in the process of seeking

³⁵ See, e.g., AT&T Opposition at 8-11; Verizon Opposition at 5.

³⁶ *Transformation Order* ¶ 970.

³⁷ *2015 Declaratory Ruling* ¶¶ 28-30.

³⁸ *Id.* ¶ 30.

³⁹ See AT&T Opposition at 10 (citing *AT&T v. FCC*, 841 F.3d at 1056).

comment on its universal service and intercarrier compensation NPRM. *YMax I* was released before the Commission had even received initial comments on the appropriate treatment of VoIP traffic.⁴⁰

Furthermore, the Commission in *YMax I* clearly reserved the issue of whether over-the-top VoIP could receive end office access charges.⁴¹ *YMax I* was a tariff interpretation order, and by its express terms was limited to the provisions of the tariff drafted by YMax. That tariff defined the End Office Switch as the place where “End User station loops are terminated.”⁴² But, as the Commission noted, other carriers had defined tariff terms differently, including by using such terms as “Virtual Transport” and “Virtual Loop Transport.” The Commission recognized that use of these alternative terms demonstrated that it was possible to draft a tariff in a manner different than YMax did, and which would clearly establish that the associated service offerings did not rely on a physical facility.⁴³ The Commission did not criticize or otherwise opine that a clear tariff would improperly apply end office switching charges, even before the *Transformation Order*.

⁴⁰ The Commission released its NPRM on universal service and intercarrier compensation on February 9, 2011, with the deadline for initial comments set at April 18, 2011. *Connect America Fund, et al.*, Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking, 26 FCC Rcd. 4554 (rel. Feb 9, 2011); *Connect America Fund, et al.*, 76 Fed. Reg. 11,632 (March 2, 2011) (announcing initial comment deadline of April 18, 2011). *YMax I*, in turn, was released on April 8, 2011.

⁴¹ See *YMax I* ¶ 14 n.55.

⁴² *Id.* ¶ 38.

⁴³ *Id.* ¶ 43 n.123.

Nor does the Commission’s discussion in *YMax I* about the pre-*Transformation Order* purpose of local switching charges⁴⁴ illuminate, as AT&T and Verizon assert,⁴⁵ the *Transformation Order*’s meaning or application of functional equivalency. The Commission in the *Transformation Order* clearly stated that it was setting out a *going forward* regime for all VoIP-PSTN traffic as part of its transition to bill-and-keep for all access charges, especially including local switching charges.

Notably, in the *Transformation Order*, the Commission expressly rejected proposals to subject all VoIP traffic to bill-and-keep.⁴⁶ The Commission opted for a symmetrical approach to VoIP intercarrier compensation, requiring VoIP providers to make access payments, but also allowing them to receive access payments. Verizon terms this “structural symmetry” and argues this supports distinguishing “facilities-based” VoIP from “over-the-top” VoIP.⁴⁷ But Verizon cites no support for that proposition from the *Transformation Order*—because there is none. Verizon falls back on the pre-*Transformation Order YMax I*, which as explained above was not—and indeed could not have been—addressing this issue.

E. Nothing in CenturyLink’s Petition Requires a “New” Definition of Functional Equivalence.

Finally, nothing in CenturyLink’s petition requires interpreting the *Transformation Order* to have created a new definition of functional equivalence, different than that enunciated in the

⁴⁴ See *id.* ¶ 40 (noting that, at the time of *YMax I*, end office switches were authorized to allow recovery of the investment in tangible connections between carriers and customers).

⁴⁵ See AT&T Opposition at 17-18; Verizon Opposition at 4-5.

⁴⁶ *Transformation Order* ¶¶ 950, 952.

⁴⁷ Verizon Opposition at 6.

Commission's *CLEC Access Charge Orders*.⁴⁸ The change the Commission made in adopting the VoIP Symmetry Rule was not to the definition of functional equivalence; it adopted a change to make clear that the functionally equivalent functions could be performed by either the LEC or its VoIP partner.

In the *Eighth Report and Order*, the Commission made clear that CLECs can assess tariffed access charges for all elements of switched access that they provide that are functionally equivalent to the elements of switched access provided by the ILEC.⁴⁹ As long as the CLEC provided each element covered by the ILEC's charges, it was entitled to the full benchmark rate. And if the CLEC did not provide an element, then it could not assess the portion of the benchmark associated with that element.⁵⁰

That is the standard of functional equivalence that CenturyLink seeks to apply here. When it or its VoIP partner provide functions comparable to the functions for which the ILEC charges, they are entitled to assess those charges—irrespective of whether they also perform functions covered by other ILEC charges. CenturyLink's (or its partner's) voice application server performs the same functions as the ILEC charges covered by 47 C.F.R. § 69.106, even though they do not provide line port connections to the loop or loop functionality—both of which are associated with charges other than § 69.106 local switching.

⁴⁸ See AT&T Opposition at 11 (citing *Access Charge Reform*, Eighth Report & Order, 19 FCC Rcd. 9108 ¶ 21 (2004) ("*Eighth Report and Order*").

⁴⁹ *Eighth Report and Order* ¶ 13.

⁵⁰ *Id.*

II. AT&T AND VERIZON’S POSTULATED DISTINCTION BETWEEN FACILITIES-BASED AND OVER-THE-TOP VOIP TRAFFIC IS UNWORKABLE AND CONTRARY TO THE TRANSFORMATION ORDER’S INTENT TO MINIMIZE UNCERTAINTY AND DISPUTES.

The application of AT&T and Verizon’s interpretation of the VoIP Symmetry Rule would result in hopeless complexity and never-ending disputes, as providers would endlessly litigate over which traffic is “facilities based” versus “over-the-top.” Today, enterprise communications solutions seamlessly blend services that might be considered “facilities based” with those that might be considered “over-the-top”—in some cases in serving the same customers at the same telephone numbers. Rather than defining the applicability of end office local switching charges on the functions performed, the real touchstone would be whether the LEC partner was affiliated with the customer’s broadband provider—a perversion of the entire regime. And this assumes that providers would be capable of distinguishing between “facilities based” and “over-the-top” VoIP—despite AT&T and Verizon’s assertions to the contrary, the use of factors like PVU factors would not only be insufficient to allow verifiable tracking of over-the-top versus facilities-based VoIP, but would create more confusion and invite disputes. Rather than achieving the Commission’s goals in the *Transformation Order*, AT&T and Verizon’s methods would embroil providers in litigation for years to come.

A. Modern Enterprise Communications Indistinguishably Blend Facilities-Based VoIP and Over-the-Top Applications into Unified Services, Including Services Offered by AT&T and Verizon.

Though AT&T and Verizon lean heavily on a supposed requirement to provide physical interconnection in order to receive end office local switching charges, that requirement has no justification, particularly in today’s communications ecosystems. Today, customers may purchase unified communications solutions from carriers that seamlessly blend facilities-based and over-the-top VoIP, even for a given telephone number. This kind of blended traffic is not

unique to competitive providers—indeed, AT&T and Verizon offer these kinds of services,⁵¹ as do CenturyLink and its CLEC affiliates, along with any number of other providers. At the same time, customers today utilize many different connectivity options, from managed network solutions to hybrid wide area networks (WANs) to Internet connections, and may obtain connectivity from a carrier that differs from the carrier providing them VoIP service. Customers may also obtain VoIP service from a third-party reseller. As illustrated below, adopting AT&T and Verizon’s interpretation of the rule would create illogical results that are inconsistent with the *Transformation Order*’s goals.

Voice Provider	Customer Connection	Connectivity Provider	Access charges?
Carrier and/or VoIP partner	Managed private network (e.g., IP VPN)	Carrier	Yes
Carrier and/or VoIP partner	Internet connection	Carrier	Yes
Carrier and/or VoIP partner	Managed private network (e.g., IP VPN)	Third party	Yes?
Carrier and/or VoIP partner	Internet connection	Third party	No

Under AT&T and Verizon’s formulation, a customer that purchases a managed private network service—an IP VPN, for instance—that interconnects with its VoIP provider’s (or its LEC partner’s) application server network could be considered to be served by “facilities-based” VoIP, because the VoIP call will travel only over the VoIP provider’s or LEC partner’s network before being delivered to the customer’s network. Put differently, the customer could be considered to have “brought its own loop” in the form of the managed private network, regardless of whether its VoIP provider or that provider’s LEC partner is also its managed private network provider. Similarly, if the customer purchases an Internet connection from the carrier that is the LEC in the call flow, end office access charges would also apply, because the

⁵¹ See Exhibits A–G, attached.

carrier (or its VoIP service provider partner) would have carried the call from the VoIP application server all the way to the customer's premises on their own facilities. But a customer that purchases an Internet connection from a third-party carrier—even if that carrier could also provide it with a managed private network service—would not be said to be served by “facilities based” VoIP and its provider would be unable to assess access charges for its calls.

In each case, the customer connection has no relationship to “interconnection” or call processing. Which kind of facilities a customer purchases are decisions rooted in the customer's budget and circumstances, not in the kind of voice service it obtains. What does not change is how the voice traffic is treated. As noted above, the IP-VPN or Internet facilities used by the customer are akin to a remote concentrator in a TDM network and do nothing more than transmit packets from the calling party (whether on an IP desk phone or a softphone or app on a computer or other device) to the equipment that initiates the call—the voice application server. There is no sound justification for treating calls delivered over one kind of pipe differently when the “switching” functions performed by the voice application server do not differ at all.

Use of hybrid wide area networks (WANs) create even trickier problems. Customers may use a hybrid WAN to connect their locations using a variety of technologies. Some of an enterprise's branch locations might connect to the WAN via an on-net fiber connection, a special access facility, or only using a VPN running on an Internet connection. As with the decision to choose a managed private network rather than an Internet connection, the decision regarding what technology to use at each location will be determined by the customer's needs and budget. Under AT&T's interpretation of the Commission's rule, end office access charges would apply for calls that go to some branches, including the on-net and off-net connections, but not all branches, including those that are connected by means of a VPN running over an Internet

connection offered by a third party. In the case of a hybrid WAN, though, the LEC has no technical ability to track which calls are which, prohibiting it from knowing when it should and shouldn't assess end office local access charges.

B. The Use of PVU Factors in Tariffs Does Not Show that Factors Are a Feasible Way to Differentiate Facilities-Based and Over-the-Top VoIP Traffic for the Purposes of Intercarrier Compensation.

Carriers today can receive all kinds of traffic from a single customer, but under AT&T and Verizon's interpretation, that traffic would have to be treated differently based on information the carrier has no access to. For enterprise customers with employees that regularly travel or telework, it could be impossible to allocate traffic appropriately. The plain fact is that it is not possible, as a technical matter, for a VoIP provider or its LEC partner to determine what traffic is "facilities based" and what traffic is "over-the-top." AT&T cites to the existence of Percent VoIP Usage ("PVU") factors to suggest that such factors could be used to determine a carrier's over-the-top VoIP traffic as compared to facilities-based traffic.⁵² But PVU factors were established to allow carriers to measure something that is ostensibly measurable—that is, aggregate VoIP traffic as distinct from other kinds of traffic. That is a very different proposition than measuring dynamically moving traffic, including traffic for a given end user that might be over-the-top in some circumstances but facilities-based in others.

PVU factors were introduced to comply with the *Transformation Order*'s direction for toll VoIP to be subject to access reciprocal compensation charges at the interstate rate. To do this, VoIP traffic needed to be distinguished from other intrastate toll traffic. Carriers therefore created PVU factors, which are similar to the Percentage Interstate Use factors used to determine the amount of intrastate and interstate access charges to apply. But in applying PVU factors, the

⁵² See AT&T Opposition at 24-26.

carrier simply determines whether traffic is interconnected VoIP; it does not determine the nature of the transport medium over which the traffic originates or terminates.

Attempting to differentiate “facilities-based” as compared to “over-the-top” VoIP use is much more problematic than AT&T and Verizon would have the Commission believe. In an IP network, as illustrated above, traffic to the same number can sometimes be facilities-based and sometimes be over-the-top. Thus a carrier would be unable to categorize traffic based on the end-user’s particular number. Rather, it would have to track the underlying transport as it dynamically changes—something that is not technically possible. It is also not clear that carriers could survey their customers: any survey information obtained would be no better than a guess, as carriers would be forced to rely on customers’ estimates—estimates that cannot be verified. The end result would be another source of disputes, rather than the streamlined, straightforward approach intended in the *Transformation Order*.

III. THE COMMISSION SHOULD ADDRESS ARBITRAGE THROUGH FURTHER REFORMS APPLICABLE TO ALL TECHNOLOGIES, RATHER THAN DISTORTING SYMMETRICAL APPLICATION OF THE ACCESS RECIPROCAL COMPENSATION RULES.

Though AT&T and Verizon assert that an interpretation of the VoIP Symmetry Rule divorced from physical facilities would “invite arbitrage on a massive scale,”⁵³ this is no different than the effect of price caps on end office local switching charges. AT&T says that if VoIP voice application servers (and other similar equipment) “could be deemed an ‘end office’ with the worldwide Internet as its ‘loop,’ over-the-top VoIP providers would be able to establish a single end office to service the entire country (or the world) with a negligible investment, relative to the providers that make significant investment in deploying broadband facilities to end

⁵³ AT&T Opposition at 19; *see* Verizon Opposition at 8-13.

users' premises.”⁵⁴ This not only conflates two different sets of charges—switching charges, which allow LECs to recover the costs of switches, and loop charges, which allow providers to recover the costs of loops—but also completely ignores the effect price caps had on a carrier's ability to collect end office switching charges. As to the first issue, end office switching charges were never intended to allow recovery of loop costs; rather, they were intended to, of course, allow recovery of switches. And as to the second, today, AT&T and Verizon could take the same action they accuse VoIP providers of and deploy a single switch to service the entire country. Nothing would prevent them from collecting end office switching charges for that switch—irrespective of their actual costs to deploy that single switch or of their loop costs.

Indeed, this idea that the Internet cannot be a loop arose from *YMax I*, in which the Commission, in interpreting YMax's tariff, reasoned that, because YMax did not define either “end user lines” or “station loops,” it would use the traditional understanding of those terms, which did not include the Internet.⁵⁵ But the Commission expressly said that it “expressed no view about whether or to what extent YMax's functions, if accurately described in a tariff, would provide a lawful basis for any charges.”⁵⁶ It also, as noted above, recognized that other carriers defined virtual loops and did not suggest that doing so was impermissible.⁵⁷

In any event, the ability to charge end office local switching charges has nothing to do with whether a carrier provides a loop or not, because the end office local switching charge is related to the provision of *end office switching*, not loop plant. LECs recoup the cost of the local

⁵⁴ AT&T Opposition at 19.

⁵⁵ *YMax I* ¶¶ 36-41.

⁵⁶ *Id.* ¶ 14 n.55.

⁵⁷ *Id.* ¶ 43 n.123.

loop, as well as the line port to connect the switch to the local loop, through the subscriber line charge and other common line rate elements, not through end office switching charges.⁵⁸ And end office switching charges are available where a carrier or its VoIP partner perform the functional equivalent of end office switching—that is, those functions that result in call initiation, monitoring, and take-down.

CenturyLink agrees that 8YY arbitrage is a problem and should be eliminated. But eliminating such arbitrage opportunities requires reforming the intercarrier compensation rules, not creating rules that allow some LECs to continue to receive end office local switching while denying that compensation to others.

⁵⁸ These elements are the End User Common Line Charge (or Subscriber Line Charge) set forth in 47 C.F.R. §§ 69.104 and 69.152, Presubscribed Interexchange Carrier Charge set forth in 47 § 69.153, and the Carrier Common Line Charge set forth in §§ 69.105 and 69.154. Other than the End User Common Line Charge, these charges have been largely supplanted by the Access Recovery Charge and, to the extent applicable, Access Recovery Connect America Fund support. *See also* Apr. 15, 2013 Level 3 Ex Parte at 3 & n.3.

CONCLUSION

CenturyLink respectfully requests the Commission resolve the ongoing uncertainty by concluding that the functions performed by the end office switch that are distinct from functions performed by other switches, including the tandem switch, are those related to initiation and termination of the voice call path and are applicable when those functions are performed by a LEC or its VoIP partner.

Respectfully submitted,



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